

ATOMIC ENERGY *newsletter*[®]

A SERVICE FOR INDUSTRY BUSINESS ENGINEERING AND RESEARCH
ROBERT M. SHERMAN, EDITOR. PUBLISHED BI-WEEKLY BY ATOMIC ENERGY NEWS CO., 1000 SIXTH AVENUE, NEW YORK 18, N.Y.

Dear Sir:

April 19th, 1955
Vol. 15 ... No. 5

Atomic radiation and its effects on living organisms is now to be thoroughly appraised by the National Academy of Sciences, the leading scientific body in the United States composed of 500 senior scientists, Dr. Detlev W. Bronk, president of the Academy, stated last fortnight. The study was instigated because of the "wide differences of opinion regarding the nature and degree of human hazards involved in the use of atomic energy", the Academy explained. (Other RADIATION news, p. 4 this LETTER.)

Record sales and net income for 1954 were recently reported by Climax Molybdenum Corp., whose annual report showed that Climax Uranium Co., (84.07% owned) earned \$600,959 after interest and accelerated amortization for the year ended May 31st, 1954. The report also disclosed that Climax Molybdenum is engaged in uranium ventures not connected with Climax Uranium Co. One such venture was its acquisition of a half interest in St. Anthony Uranium Corp., holding property near Anaconda Copper's uranium producing properties in Valencia County, N.M. The firm will explore the property in 1955. (Other FINANCIAL news, p. 5 this LETTER.)

Separating liquid interfaces with radioisotopes (a method used by pipeline transporters to find separation points in liquids being piped) is now disclosed in an 11 claim U.S. patent granted April 12th, 1955, and assigned to Calif. Research Corp., San Francisco. The patent (No. 2,706,254) notes that barium-140 and antimony-124 are satisfactory isotopes for such work. (Other PRODUCT news, p. 3 this LETTER.)

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Following a five week trip abroad to explore export potentialities in the nuclear reactor business, L. R. Hafstad, director of the atomic energy division of the Chase National Bank, said in New York last fortnight that India, Italy, Japan and Brazil are good prospects for nuclear power plants. There is uranium and thorium in India and Brazil, he explained, and they are eager to industrialize. Italy and Japan need power badly, he noted, but observed that they lack raw material. (Dr. Hafstad until last year was director of nuclear reactor development for the USAEC.) (Other NUCLEAR REACTOR news, p. 2 this LETTER.)

A section to study the special needs of nuclear power plants has now been established by the English firm of Brush Electrical Engineering, Ltd., at the Loughborough works of this firm. The section will be under the direction of J.H.R. Nixon. The company has already developed and supplied specialized electric motors in large quantities for the use of the U.K. Atomic Energy Authority in some of their current operations.

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ATOMIC ENERGY BUSINESS REPORTS...

BASIC REGULATIONS FOR CIVILIAN ATOMIC INDUSTRY ISSUED:- Three new regulations which provide the essential information needed by private firms to prepare license applications for private nuclear reactors as used in electric generating plants have now been issued by the USAEC. The regulations become law 30-days after publication in the Federal Register, and require that the firm "be qualified by training and experience to use fissionable material safely and have a legitimate use for such material". Detailed plans and specifications must be submitted by applicants; safety measures must be shown; and the Government would continue to own all fissionable material loaned for use in the plant. The USAEC also noted that in times of national emergency it may take back fissionable material; take over plants; order the plants shut down; or order the reactor to produce at certain rates.

NUCLEAR REACTOR POWER PLANT PROPOSALS MADE:- Four public and private groups have submitted plans to the USAEC to build nuclear reactor power plants, under the USAEC's demonstration reactor program, the Commission announced in Washington last fortnight. (Building plants under this program gives such advantages as the waiving by the USAEC of established charges for loan of source and nuclear materials, the performing in USAEC laboratories of certain work without charge to the firms, etc.)

The four plants are: (1) Boiling water reactor plant of 180,000 kw. capacity, to be completed in 1960; proposed by Nuclear Power Gp., which consists of four electric utilities and Bechtel Corp., San Francisco. (2) Light water moderated and cooled reactor plant of 100,000 kw. capacity, to be completed in late 1957; proposed by the Yankee Atomic Electric Co., Boston, members of which are twelve New England electric utilities. (3) Fast breeder reactor plant of 100,000 kw. capacity, to be completed in late 1958; proposed by Detroit Edison Co., in association with eight other electric utilities. (4) Sodium graphite reactor plant with 75,000 kw. capacity, to be completed in 1959; proposed by the Consumers Public Power District, Columbus, Neb.

Cost of these plants will total \$150,000,000; of this the Government will pay 10-20%, with the sponsors paying the balance. (USAEC officials have stated privately that the Government was prepared to pay as much as 50% of the cost of these plants.) These plants, with the one that the Consolidated Edison Co. of New York will erect at Buchanan, N.Y., and announced previously, will have a total capacity of 705,000 kw., or about three-quarters of 1% of the present electrical generating capacity in the United States.

FIRST PRIVATELY-OWNED NUCLEAR TEST REACTOR TO BE BUILT:- Some \$6.5 million will be spent by Westinghouse Electric Corp. to erect a nuclear reactor for the purpose of testing reactor fuel elements and other components of nuclear power plants under actual operating conditions, Gwilym A. Price, Westinghouse president, said last fortnight in Pittsburgh. The new reactor, to be built on a 550 acre site near Blairsville, Pa., 40 miles east of Pittsburgh, will enable Westinghouse to be independent of the USAEC's materials testing reactor in Idaho, and other Government reactors, and Canada's Chalk River reactor, where test facilities are now available. This Westinghouse test reactor will use highly enriched uranium as the power source, and water as moderator and coolant.

URANIUM REFINING PLANT TO EXPAND:- Vitro Rare Metals (div. of Vitro Corp. of America) which refines and recovers rare metals, and processes uranium-bearing ores and residues for the USAEC, intends to spend \$200,000 in 1955 to expand and modernize its Canonsburg, Pa., plant. The plant, built in 1909 for the Standard Chemical Co., was originally the largest producer of radium salts in the U.S.

TWO NEW NUCLEAR REACTOR POWER STUDIES TO BE MADE:- Nuclear power studies are now to be made by the National Rural Electric Cooperative Association, which consists of rural electric cooperatives, and the Puget Sound Utilities Council, which comprises five electric utilities in the State of Washington. Both studies, to be made under the USAEC's industrial participation program, are to determine which nuclear power systems are most economically feasible to the purposes of the organizations.

NUCLEAR EQUIPMENT FIRM EXPANDS:- El-tronics, Inc., Philadelphia manufacturer of nuclear and other electronic instrumentation, has now leased a 65,000 sq. ft. plant at Mayfield, near Scranton, Pa. T.P. Tanis, president of El-tronics, said production will get underway as soon as installation of equipment is completed, and that within six months "several hundred" people will be employed there.

NEW PRODUCTS, PROCESSES & INSTRUMENTS...for nuclear lab & plant...

MANUFACTURERS' OFFERINGS OF NEW PRODUCTS:- Model CS-100 Radimax collimated scintillation counter, with heavy shielding for maximum directionality, is supplied with a 1" x 1" sodium iodide crystal. With the removable forward shield in place, a ratio of at least 50:1 is obtained, the manufacturer states, between count rates from an iodine-131 source within the acceptance cone and one outside at the same distance from the crystal. Model CS-100 includes a photomultiplier chosen for good signal-to-noise characteristics. -- NRD Instrument Co., St. Louis 14, Mo.

Trade-named ISO-X is a new portable X-ray machine using the radioisotope thulium-170 as the source. The source is said to have a usable life of about one year, after which it requires irradiation. The manufacturer suggests both industrial and medical uses for the instrument. --Litton Industries, Beverly Hills, Calif.

PRODUCTS IN DEVELOPMENT STAGE:- A semiconductor device that converts either light or atomic radiation directly to usable electrical energy was described last week at a meeting of the American Institute of Electrical Engineers (southern district) in St. Petersburg, Fla., by E. G. Linder, P. Rappaport, and J. J. Loferski of Radio Corp. of America's research laboratories, Princeton, N.J. The RCA development is a silicon wafer about $\frac{1}{4}$ " in diameter and 1/100-in. thick, into which an impurity is alloyed to form a junction. When strontium-90 is used as the radioactive source, the junctions are arranged around the source to intercept as much as possible of the radiation. The research workers found that the beta particle bombardment by the strontium-90 damaged the crystal wafer. They stated, however, that such damage was found to decrease as the energy of radiation decreases, and that there is a threshold below which damage will not occur.

Pilot installations are now being made by Pyrene Manufacturing Co., Newark, N.J., of a new fire detection system developed by the firm which uses radium to ionize the air in a detector head containing two electrodes. When combustion products enter the detector head, the firm states, the electrical resistance between the two electrodes is increased; this change in resistance operates the alarm system.

Preliminary designs for commercial radiation equipment using radioactive cobalt were recently disclosed by W. E. Chamberlain, assistant to the director, atomic energy department, American Machine & Foundry, at the atomic energy conference in San Francisco sponsored by Stanford Research Institute and the Atomic Industrial Forum. Applications suggested by Mr. Chamberlain for the apparatus included its use to kill insects in stored food grains; to preserve potatoes held in storage by inhibiting their sprouting; etc. He estimated cost of the machine at \$40,000 plus the cost of the cobalt source.

PRODUCTS FOR NUCLEAR REACTORS:- Canada is now producing six tons of heavy water annually at a cost of between \$720,000 and \$1,200,000 (Canadian dollars) a ton, and this output is too small for future needs, H. K. McRae, of the chemical engineering section, Atomic Energy of Canada, Ltd., recently told the annual meeting in Toronto of the Chemical Institute of Canada (chemical eng. div.). He noted that the requirements of nuclear power plants for heavy water will require expanded production and lowered costs. (Heavy water for Britain's nuclear reactor needs will be provided by a joint enterprise of the U.K. Atomic Energy Authority and the New Zealand Government known as Geothermal Development, Ltd. The firm will construct a plant and produce heavy water and electric power from geo-thermal steam in the Wairakei district of North Island, New Zealand. Messrs. Merz and McLellan (N.Z.) are consultants to the New Zealand Government on electric power, and Head Wrightson Process, Ltd., (Eng.) are consultants to the British Atomic Energy Research Establishment on heavy water. The company will use the N.Z. Ministry of Works as its construction agent. It is expected that the production of heavy water will begin late in 1957, and electric power a few months later. The U.K. Atomic Energy Authority will take the entire output of heavy water; and the N.Z. State Hydro-Electric Dep't. the whole of the net electric power available.)

PRODUCTS IRRADIATED & MARKETED:- General Electric Co.'s new irradiated polyethylene film, trade named Irrathene 201, is now being offered to fabricators at 65¢/sq. yd. in 5-mil thicknesses, and at \$1.30/sq. yd. in 10-mil. thicknesses.

CONFERENCES, MEETINGS & COURSES...on nuclear subjects...

American Society of Mechanical Engineers:- Two sessions of the ASME meeting at Baltimore, Md., this week (Apr. 18-22) are devoted to nuclear energy. Papers include H.E. Stone, General Electric, on Shielding Concepts for Nuclear Reactors; R.H. Shannon and I.G. McChesney, United Engineers & Contractors, Inc., on Benzene as Thermodynamic Working Fluid for a Nuclear Power Plant; W.R. Gall, Oak Ridge National Laboratory, on The Homogeneous Reactor Experiment, a Pilot Model Nuclear Power Plant; D.O. Leeser, Detroit Edison Co., on Basic Materials for Nuclear Fueled Power Plants; C.C. Woolsey, North American Aviation, Inc., on Selection of Materials for a Sodium Graphite Reactor System; and H.H. Hausner and M.C. Kells, Sylvania Electric Products, Inc., on The Role of Powder Metallurgy in the Design of Nuclear Reactors. (Certain of these papers are available at nominal cost from the ASME, 29 W. 39th St., NYC 18, to whom inquiries should be made.)

Atomic Energy Research Establishment, Harwell, Eng.:- A conference on the utilization of electromagnetically enriched isotopes will be held at the AERE from Sept. 15-16, 1955. Sessions will include design and operation of large mass separators; ion source and collector problems; separation of radioactive materials; chemical aspects of production work; preparation of isotopic targets; and other subjects. Provisional acceptance has been received from leaders of the separator groups in Holland, France and Denmark and from leading members of the team responsible for the work on stable isotopes at Oak Ridge, Tenn., in the United States. (Further information may be obtained from Dr. M.L. Smith, AERE, Harwell, Didcot, Berks., England.)

Iowa State Teachers College:- A two week workshop at this College (Cedar Falls, Ia.) on the Use of Radioisotopes in High School Science Teaching will be held June 13-25, 1955. The science department of the College, with the technical assistance of the USAEC, will conduct the course which will include lectures by visiting physicists and others who are authorities in their field.

IONIZING RADIATION...applications, investigations & other news...

Medical Applications:- Plastic needles and sutures, which contain yttrium-90, and which dissolve slowly in body fluids leaving a deposit of the radioactive yttrium --for possible localized therapy of cancer--have been developed at the U.S. Naval Hospital, St. Albans, N.Y., Commander H.C. Dudley, of the Navy's Medical Service Corps reported at the American Chemical Society meeting in Cincinnati recently. The plastic filaments permit irradiation at any desired location with virtually no effect on the bones and organs and may be useful in combatting inoperable tumors, he stated. The findings are the result of experimental work on laboratory animals, and have not yet been tried clinically. He pointed out that earlier needles were made with radioactive phosphorous but tests on animals showed too much radioactive material appeared in blood plasma and bone.

Another application of yttrium-90 was reported to the Federation of American Societies for Experimental Biology, meeting in San Francisco last week, by research workers from the University of Chicago. They reported that using a cat in laboratory experiments they obtained favorable results treating the brain tumor known as glioma by using yttrium-90. Dr. Paul V. Harper, of the Chicago group, said the treatment may be more effective than surgery.

State Legislation:- Hearings are now being held in New York City on the new State labor code governing applications of ionizing radiation. The rules are the result of a two year study by the State Board of Standards and Appeals, and cover everything from fluoroscopes used to fit shoes to industrial use of radioisotopes. Copies of the draft may be obtained from the Board at 11 N. Pearl St., Albany, N.Y.

In Britain:- The U. K. Atomic Energy Authority is now setting up a new department at Harwell to investigate the effects of irradiation on materials and its possible industrial applications. The department will be concerned with the study of the techniques of changing the physical structure of materials by exposing them to radioactivity either in nuclear reactors, or in equipment where nuclear reactors by-products in the form of radioactive ash are used as a radiation source.

ATOMIC ENERGY FINANCIAL REPORTS...

PROFITS IN NUCLEAR WORK SOME YEARS AWAY, STOCKHOLDERS TOLD:- The high cost of research and development in nuclear power activities will make profits from such work some years away, Alfred I. Iddles, president, Babcock & Wilcox Co., said at a stockholders meeting in New York last fortnight. Mr. Iddles noted that the firm now had more than 100 physicists and engineers working in the nuclear energy field exclusively. The firm eventually expects to make money from nuclear energy work, he said, else it wouldn't be so intensively engaged in nuclear activity. (It is building a plant at Lynchburg, Va., to manufacture nuclear fuel elements; offers generally several reactors which it is capable of constructing; and has firm orders for a \$1 million research reactor for the University of Michigan as well as for a power reactor for the Consolidated Edison \$55 million nuclear power facility that utility will construct.)

RADIOACTIVITY WELL LOGGING INCOME OFF, FIRM STATES:- While new records for both gross and net income were set in 1954 by Lane-Wells Co., oilfield servicing and supply firm, the company's income from radioactivity well logging declined slightly, John J. Neale, president, has stated in the firm's annual report for 1954. (This was the firm's last annual report; it was merged into Dresser Industries last March.) Gross income of Lane-Wells for 1954 was \$28,997,517, with a net income of \$2,426,176.

URANIUM MINING STOCK PLACED:- Among the numerous uranium mining flotations offered, an offer of 200,000 shares of Shumway Uranium Mining Corp. \$1 par non-assessable common stock, made by the underwriter (Doxey-Merkley & Co., Salt Lake City, Utah), at \$1, less underwriting commission of 13 $\frac{1}{2}$ per share, has now been completed according to Doxey-Merkley. Funds are to be used for surveying, construction of roads, and drilling on the company's 395 uranium-vanadium claims.

SECURITY ANALYSES OFFERED:- Reviews of firms in nuclear work are available on request from: Paine, Webber, Jackson & Curtis, 25 Broad St., NYC, who discuss Climax Molybdenum Co.; from Ira Haupt & Co., 111 Broadway, NYC, who cover American Machine & Foundry (whose new subsidiary is AMF Atomics); from George A. Searight, 115 Broadway, NYC, on U.S. Lithium, Quebec Lithium, and Basic Atomics; from L.F. Rothschild & Co., 120 Broadway, NYC, who analyze American Smelting & Refining Co.; and from Fahnestock & Co., 65 Broadway, NYC, who discuss Vanadium Corp. of America. (The Atom & Investors has been prepared by Merrill Lynch, Pierce, Fenner & Beane, 70 Pine St., NYC; sent n/c on request.)

NEW BOOKS & OTHER PUBLICATIONS...in the nuclear field...

Nuclear Notes for Industry; Issue of Apr. 7, 1955. A listing of current USAEC-developed unclassified information of special industrial interest. --USAEC, Tech. Info. Service, Oak Ridge, Tenn. (n/c)

The New Men, by C. P. Snow. A popular treatment of the discovery of nuclear fission. 511 pages. --Charles Scribner's Sons, New York. (\$3.50)

A Programme of Nuclear Power. Official transcript of the British plan to construct 12 nuclear power plants in the next 10 years; as presented to Parliament by the Lord President of the Council and the Minister of Fuel & Power. --H. M. Stationery Office, London, Eng. (9d.)

Nuclear Physics, by Irving Kaplan. Covers the background of nuclear physics with special topics and applications. 609 pages --Addison-Wesley Pub. Co., Cambridge, Mass. (\$10.00).

PEOPLE...in atomic energy work...

New general manager of the USAEC is to be B/G K. E. Fields, who will be promoted to this position May 1st from his present post of director of division of military applications. He will succeed M/G K. D. Nichols who will resign April 30 to go into private engineering practice in Washington, D.C., as a consultant.

T. J. Thompson has now been appointed an associate professor of nuclear engineering in the department of chemical engineering, Massachusetts Institute of Technology, Cambridge. Dr. Thompson's immediate assignment will be as director of the MIT project for construction of New England's first privately-owned nuclear reactor.

Sincerely,

The Staff,
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